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Demographic characteristics and clinicopathological features of lymphoma (HL and NHL) in Libya

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ABSTRACT

Purpose: To establish the prevalence of lymphoma in Libya and to describe the demographic characteristics of patients based on the official records of the national oncology institute and to mention some of the clinicopathological characteristics to be compared with other results that have been recently published internationally.

Materials and Methods: Between 2013 and 2015, 25 lymphoma patients, ranging in age from 15 to 90 (mean age: 43), registered at the National Oncology Institute in Sabratha, were examined for the incidence rate of lymphoma and the identification of epidemiological and clinicopathological aspects. The tumor was divided into stages 1, 2, 3, and 4 with a representative percent of 8%, 44%, 36%, and 12 % respectively. For grading the samples, at least one tissue section of 5 µm thickness was stained with hematoxylin and eosin red stain.

Results: There were 6,4 new cases of lymphoma per 100,000 people in Libya. This figure can be broken down into 3.8 NHL and 2.6 HL. Lymphoma incidence in the Libyan population is highly correlated with middle age, with almost 60% of cases occurring in those between 20 and 60 years old, with a mean age of 43. The total number of cases belonging to grade 1 was 6 cases (24%) divided into 4 (66.7%) in the coast region, 2 (33.3%) in the mountain region, and 0 cases in the south region. Grade 3 was represented the higher number of patients with 10 patients (40%) as compared with grade 2 (8 cases, 32%) and grade 4 (1 case, 4%) and most patients were located in the coast region. Additionally, the number of patients with NHL was 18 (72%) divided into 14 (77.8%) in the coast region, 2 (11%) in the mountain region, and 2 (11%) in the south whereas the number of patients with HL was 7 (28%) divided into 6 (85%) in coast region and 1 (14.3%) in the south region with no HL cases in mountain region.

Conclusion: The results suggest the importance of achieving more studies in the future to explore the risk factors behind the prevalence of such type of blood cancer in Libya. *(Open J Bio Med Res 2022;1:28-32.)*

Keywords

Lymphoma, Hodgkin lymphoma, Non-Hodgkin lymphoma, Epidemiology features, Clinicopathological characteristics, Libya.

AUDIOABSTRACT

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INTRODUCTION

Lymphoid neoplasms are one of the most common malignancies worldwide.[1] It is a heterogeneous group of malignant neoplasms in the reticuloendothelial and lymphoid system; lymphoma is the most common type of blood cancer in the united states.[2] Therefore, it's the seventh most common cancer in adults and the third most common in children.[2]

In recent years, there has been a growing awareness regarding this type of neoplasms, and as a result, cancer registries around the world report an increasing number of such malignancies with detailed classifications according to the histological subtype. Actually, when comparing populations from North America for example with those of Europe or the Far East, striking differences are noted. This suggests that environmental factors could be linked to the frequency of such malignancies.[3-6]

One of the most important types of lymphoma is peripheral T-cell lymphoma (PTCL) which consists of a heterogeneous group of lymphomas that develop from

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mature lymphocytes and represents approximately 6% to 10% of all non-Hodgkin's lymphoma (NHL) cases.[7] Most patients with PTCL display a highly aggressive clinical course and short survival.[8,9] Additionally, patients with relapsed or refractory PTCL are unlikely to survive for more than a few months.[10, 11] Therefore, early identification of those at risk of relapse or progression is critical for the timely initiation of appropriate treatment to prolong the survival time and this reflects the importance of the overall survival (OS) as an endpoint in clinical trials. On the other hand, a shorter follow-up time is very important in such cases.

In this context, studies confirmed that patients with diffuse large B-cell lymphoma (DLBCL) who achieved event-free survival (EFS) at 24 months (EFS24) were unlikely to die from lymphoma-related causes. As a result, their subsequent (OS) was comparable to that of the general population.[12] Similar findings have been reported in patients with Hodgkin's lymphoma and follicular lymphoma.[13,14]

Concerning the demographic features, epidemiological studies allow for the estimation of the population affected by lymphoma and reflect the sociodemographic characteristics of those who suffer from it, and determine the causes that are possibly implicated in its spread.

The primary cause of lymphoma is unknown, but many factors can increase its risk including age, sex, autoimmune diseases, and a diet rich in meat.[15] Therefore, the contribution of different risk factors and causes of lymphoma development may vary from one region to another. Actually, in Libya, there was no previous study talking about this subject.

Internationally, there were many such studies.[16,17] One of those studies determined the frequency of different types of lymphoma in the Al-Qassim region from 1988 to 2007, according to the World Health Organization classification.[18] The results of this study showed that NHL was the most common type found in that region. In 2008, NHL was one of the most common types of cancer in Saudi Arabia and ranked second in cancer incidence among the male population, with a male-to-female ratio of 1.22:1.[19] In Egypt, NHL was the 5th most common cancer in both males and females[20] whereas in Yogyakarta, a city on the Indonesian island, there was a noticeable increase in the incidence of Lymphoma from 2010 to 2014, and it was more common in 45–the 64-year age group with a male predominance.[21] In the USA, NHL was the most common cancer in 2018.[22]

On the other hand, concerning the clinicopathological features of lymphoma, and according to the classification of world health organization (WHO), lymphoid neoplasms are classified into two groups based on B or T/NK cell origin and further classified into a precursor or mature cell types.[23] Most mature B-lymphoid neoplasms show disease-specific chromosome abnormalities. Lymphoma/ leukemia cases with both 18q21.3/BCL2 and 8q24/MYC translocations to IG genes are rarely identified and most of them are classified as B-cell lymphoma, unclassifiable, with features intermediate between diffuse large B-cell lymphoma and Burkitt's lymphoma (IL). These lymphomas are termed BCL2/ MYC dual-hit lymphoma/leukemia (DHL). Although DHL has been reported to have a poor prognosis[23] the clinicopathological characteristics of this condition have not been sufficiently studied yet.

The objectives of this study were to establish the prevalence of lymphoma in Libya to describe the demographic characteristics of patients based on the official records of the national oncology institute and to mention some of the clinicopathological characteristics to be compared with other results that have been recently published internationally.

MATERIALS AND METHODS

Between 2013 and 2015, the files and paraffin-embedded histological samples of 25 lymphoma patients aged from 15 to 90 years (mean age: 43) with a new diagnosis of any kind of NHL and HL (according to WHO classification) who are recorded in national oncology institute in Sabratha (SNOI) has been considered as a participant in this study. The tumor stages were divided into stages 1, 2, 3, and 4 with a representative percent of 8%, 44%, 36%, and 12 % respectively. The survival rate follow-up observations and clinicopathological data including age, gender, lymphoma stages, grade, and systemic status were collected from the patient's files.

At least one section of 5 µm thickness was stained with hematoxylin and eosin stain for re-grading the samples. There were 18 non-Hodgkin lymphomas (72%), and 7 Hodgkin lymphoma (28%). Evaluation of incidence and incidence data has been based on the histologically verified cases according to SNOI registered data up to the end of 2014.

Statistical analyses were performed using SPSS for Windows, version 19 (SPSS, Inc., Chicago, USA), software packages. Frequency tables were analyzed using the Chi-square test, with likelihood ratio (LR), or Fischer's exact test to assess the significance of the association between the variables. Comparison of numerical data was done by the chi-square test and Student's t-test. Analysis of variance (ANOVA) was used for deriving the mean values. For survival analysis, Kaplan- Meier curves were plotted, and differences between the curves were analyzed using the log-rank test (KM-LR). And P values < 0.05 were considered statistically significant. The OS was calculated from the date of the confirmation of the histopathological diagnosis until the date of death due to any cause.

RESULTS

Epidemiological features (Gender status)

Twenty-five cases in three different regions with diagnosis of lymphoma were included in this study (Fig. 1). As shown in Table 1, this number of cases has been distributed in all three regions into males and females with a total number of 14 (56%) and 11 (44%) cases, respectively. The distribution of cases was not compatible in all regions due to the difference in the total count of the population in each region. Consequently, the great number of lymphoma cases was concentrated in the coast region whereas the number of cases in both mountain and south regions were rare. As a percentage of gender status in different regions, males were representing 71.4% in the coast region, 7.1% in the mountain region and 21.5% in the south region whereas females were representing 90.9%, 9.1%, and 0.0% respectively in the same regions. The occurrence of lymphoma in the Libyan population is strongly related to middle age with about 60% of cases arising in persons who are between20-60 old years with a mean value of 43 years old. A larger fraction of the patients was male (56%); this difference was true in both Hodgkin and non-Hodgkin lymphoma. The clinic pathological differences between the coast, mountain, and south populations were prominent. Patients in the coast and mountain regions were younger than southern at presentation with a mean age of about 42, 45, and 55 years, respectively.

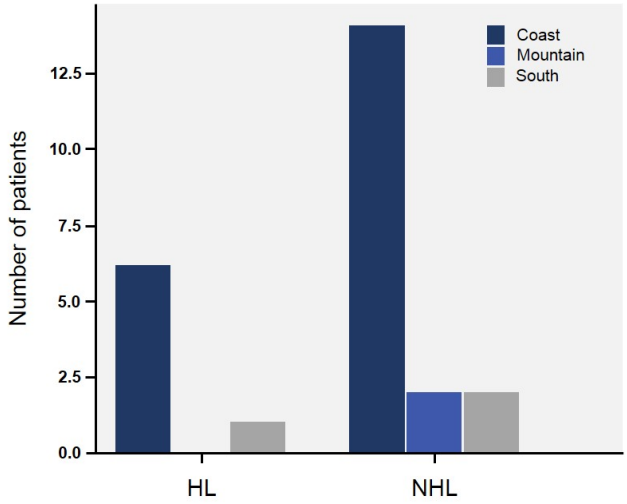

Fig 1. Distribution of lymphoma patients in different regions.

Table 1. Summary of patient's demographics and clinical-pathological parameters of Lymphoma cases.

Variable		Coast region	Mountain Region	South Region
Mean ± age at diagnosis (SD)		42.0± 23.6	45.0 ±0.1	55.0±34.6
Gender status	Male 14(56%)	10(71.4%)	1(7.1%)	3(21.5%)
	Female 11(44%)	10(90.9%)	1(9.1%)	0(0%)
Systemic metastasis	Positive Mets 3 (12%)	1(33.3%)	0(0%)	2(66.7%)
	Negative Mets 22 (88%)	19(86.4%)	2(9.1%)	1(4.5%)
Histological grade	Grade1 6(24%)	4(66.7%)	2(33.3%)	0(0%)
	Grade 2 8(32%)	8(100%)	0(0%)	0(0%)
	Grade 3 10(40%)	8(80%)	0(0%)	2(20%)
	Grade 4 1(4%)	0(0%)	0(0%)	1(100%)
Histological type	NHL 18 (72%)	14(77.8%)	2(11.0%)	2(11.1%)
	HL 7 (28%)	6(85.7%)	0(0%)	1(14.3%)
Clinical stage at diagnosis	Stage 1 2(8%)	1(50.0 %)	1(50.0%)	0(0%)
	Stage 2 11(44%)	10(90.9%)	1(9.1%)	0(0%)
	Stage 3 9(36%)	(88.9%)	0(0%)	1(11.1%)
	Stage 4 3(12%)	1(33.3%)	0(0%)	2(66.7%)

Systemic metastasis and histological grade

A statistically significant correlation was observed between the pathological type of lymphoma and the most clinic pathological features, with association observed for histological grade status (P= 0.01) and metastasis (P= 0.08). In detail, the number of patients with positive metastasis was 3 representing 12% located in two regions (1 case on the coast and 2 in the south) with a percent of 33.3% and 66.7%, respectively. On the other hand, the number of patients with a negative metastasis was 22 cases representing 88% divided into 19 (86.4%) in the coast region, 2 (9.1%) in the mountain region, and 1 (4.5%) in the south region.

Concerning histologic grade, the total number of cases belonging to grade 1 was 6 cases (24%) divided into 4 (66.7%) in the coast region, 2 (33.3%) in the mountain region, and 0 cases in the south region. Grade 3 was representing the higher number of patients with 10 patients (40%) as compared with grade 2 (8 cases, 32%) and grade 4 (1 case, 4%) and most patients were located in the coast region.

Histological type and clinical stage at diagnosis

The number of patients with NHL was 18 (72%) divided into 14 (77.8%) in the coast region, 2 (11%) in the mountain region, and 2 (11%) in the south whereas patients with HL were 7 (28%) divided into 6 (85%) in coast region and 1 (14.3%) in the south region with no HL cases in the mountain region.

Concerning clinical stages, most patients who participated in this study were diagnosed as cases of stage 2 (11 cases, 44%) followed by stage 3 (9 cases, 36%) then stage 4 (3 cases, 12%), and finally stage 1 (2 cases, 8%). and they displayed a correlation with histological grade (P= 0.01).

DISCUSSION

Lymphoid neoplasms have a wide range of biological, clinical, and morphological features. Even if restricted to the group of non-Hodgkin lymphoma (NHL), there is a wide variety of entities with different clinical features.[23] Etiologically, the primary cause of lymphoma is unknown. Many factors that can increase its risk include age, sex, autoimmune diseases, and a diet rich in meat.[15] However, the contribution of different risk factors to lymphoma development may vary in different regions.

During the current study, 25 lymphoma patients with a mean value of 43 years old have been investigated for determination of the epidemiological characteristics and the clinic pathological features. In this context, this study has revealed that the estimation of the incidence rate of lymphoma in Libya was 6,4 new cases/per 100,000 of the population. In detail, this value could be divided into 3.8 NHL and 2.6 HL. The occurrence of lymphoma in the Libyan population is strongly related to middle age with about 60% of cases arising in persons who are between 20-60 old years with a mean value of 43 years old. Previously, it has been suggested that HL represents approximately 10 % of all lymphoma diagnoses and T cell lymphoma accounts for approximately 10% of cases of NHL.[3,5,6,24,25.]

On the other hand, the current study recognized that the geographical differences between the populations of Libya are prominent. The coastal population is older than the populations of the mountain but younger than the populations of the south. The populations aged over 60 years were 66.6%, 25%, and 0% in the South, Coast, and Mountain regions respectively. However, the age group below 30 years was smaller in the mountain than on the coast. According to the current study results, this can be partially explained by the remarkable difference in socio-educational facilities among the population who live in the three studied regions. It is worth mentioning here that most coastal and mountain populations have socio-educational facilities above the average line, whereas about a third of the southern population live below the average line. This contributes to low education, less awareness of the disease, poor health care, and the delay-time of diagnosis which explains the increased risk of advanced tumors. On the other hand, the economic improvement in Libya might be linked to an improvement in the early detection of lymphoma. Additionally, concerning systemic metastasis and histological grade, the current study has observed a statistically significant correlation between the pathological type of lymphoma and the most clinic pathological features, with the strongest association, observed for stage status and metastasis. In previous studies carried out in the North American population, where indolent lymphomas are more prevalent.[3,26] Laurini et al. in a large study that included individuals from Central and South America (CSA) found an increased relative frequency of high-grade B cell neoplasms among patients from Brazil, Guatemala, and Peru. When considering the region of origin, they also confirmed that diffuse large B cell lymphoma (DLBCL) was significantly more frequent among patients from CSA than among North Americans (40 vs 29.2 %).[27]

Briefly, the clinic pathological differences between the coast, mountain, and south populations were prominent. Patients in the coast and mountain regions were younger than southern at presentation with a mean age of about 42, 45, and 55 years respectively, and they displayed favorable features such as low histological grade (P= 0.01) and stage (P= 0.01), and rare systemic metastases (P= 0.08). However, the histological types and gender type are not showing any significant difference. These results are compatible with previous results from other studies.[16,28] Notably,

about clinical stages, it has been found that most patients who participated in this study was diagnosed as a case of stage 2 (11 cases, 44%) followed by stage 3 (9 cases, 36%) then stage 4 (3 cases, 12%), and finally stage 1 (2 cases, 8%).

CONCLUSION

This study has found that the lymphoma incidence rate in Libya is 6.4 new cases/per 100,000 of the population divided into 3.8 NHL and 2.6 HL with a mean age of 43 years old and a recognizable geographical and clinic pathological difference. These results suggest the importance of achieving more studies in the future to explore the risk factors behind the prevalence of such blood cancer in this country.

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